

EXHIBIT 68
FILED UNDER SEAL

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

WAYMO LLC,

Plaintiff,

vs.

UBER TECHNOLOGIES, INC.,
OTTOMOTTO LLC; OTTO TRUCKING
LLC,

Defendants.

)

)

)

)

)

) Case No.:

) 3:17-cv-00939-WHA

)

)

)

)

)

)

ATTORNEYS' EYES ONLY

VIDEOTAPED DEPOSITION OF JAMES HASLIM

San Francisco, California

Tuesday, April 18, 2017

Volume 1

Reported by:

RACHEL FERRIER, CSR No. 6948

Job No. 2597892

PAGES 1 - 112

<p>1 Q When you say "we," who are you referring to? 09:52:00</p> <p>2 A The entire LiDAR team. 09:52:02</p> <p>3 Q Including Mr. Levandowski? 09:52:05</p> <p>4 A I wouldn't consider him on the LiDAR team. I -- 09:52:07</p> <p>5 I would not actually consider him as part of that -- 09:52:11</p> <p>6 those next steps at all. 09:52:12</p> <p>7 Q Okay. So what are -- what is the approach you 09:52:14</p> <p>8 landed on for putting multiple channels onto a sensor? 09:52:20</p> <p>9 A The approach we landed on was to take eight fiber 09:52:26</p> <p>10 lasers. Split each of those fiber lasers into their own 09:52:31</p> <p>11 eight individual fibers. So now we have eight times 09:52:36</p> <p>12 eight. That's 64 optical fibers with laser light coming 09:52:38</p> <p>13 out of them. 09:52:42</p> <p>14 We decided to use eight optical cavities and 09:52:43</p> <p>15 to -- how shall I say -- matrix or interlace those 09:52:49</p> <p>16 fibers from those individual into those eight optical 09:52:54</p> <p>17 cavities. The optical cavities would also have 09:52:57</p> <p>18 corresponding detectors to receive the light. The 09:53:01</p> <p>19 entire assembly would spin. 09:53:07</p> <p>20 Q Is this the Spider design? 09:53:15</p> <p>21 A Yes. 09:53:18</p> <p>22 Q Okay. So the eight fibers -- so there would be 09:53:18</p> <p>23 eight -- just to put it in a little bit more layman's 09:53:25</p> <p>24 term, there would be eight lasers going through one 09:53:29</p> <p>25 lens; is that right? 09:53:32</p> <p style="text-align: right;">Page 38</p>	<p>1 detectors had to be placed in precise location as well, 09:54:40</p> <p>2 and those would be aligned to each other. 09:54:44</p> <p>3 BY MR. JAFFE: 09:54:45</p> <p>4 Q And how did you align them to one another? 09:54:45</p> <p>5 A We didn't have a lot of success in that process, 09:54:47</p> <p>6 making that alignment. I had started with the process 09:54:54</p> <p>7 of aligning one channel, and so one approach is to 09:54:58</p> <p>8 adjust the position of the -- one of the avalanche 09:55:04</p> <p>9 diodes while a laser is firing at some target at a known 09:55:07</p> <p>10 distance until you got a maximal electronic response. 09:55:14</p> <p>11 Q Were each -- can you tell me how the -- each of 09:55:17</p> <p>12 the fibers were arranged with respect to a PCB, if at 09:55:27</p> <p>13 all? 09:55:31</p> <p>14 A The fibers would be arranged in a pattern similar 09:55:31</p> <p>15 or even matching the positions of the avalanche diodes 09:55:41</p> <p>16 on their PCB. 09:55:44</p> <p>17 Q So the eight fibers would be on one PCB; is that 09:55:45</p> <p>18 right? 09:55:48</p> <p>19 A The eight fibers were not on a PCB. 09:55:48</p> <p>20 Q So how were the fibers arranged? 09:55:52</p> <p>21 A The fibers were arranged in a mechanical assembly 09:55:56</p> <p>22 in the machined component. 09:55:59</p> <p>23 Q Were the fibers in a component such that they 09:56:01</p> <p>24 could be individually moved around, or was it the 09:56:06</p> <p>25 photodetectors that you were moving around? 09:56:09</p> <p style="text-align: right;">Page 40</p>
<p>1 A There would be light from eight different lasers 09:53:32</p> <p>2 that went through one lens 09:53:36</p> <p>3 Q Okay And then it would go out into the 09:53:38</p> <p>4 environment -- 09:53:41</p> <p>5 A Yes 09:53:41</p> <p>6 Q -- hit a target, and then it would bounce back 09:53:41</p> <p>7 through that same lens; right? 09:53:44</p> <p>8 A Yes This is the case for one of the optical 09:53:45</p> <p>9 cavities, yes 09:53:50</p> <p>10 Q And then it would -- what would happen next in 09:53:50</p> <p>11 the -- in the design? 09:53:54</p> <p>12 MR KIM: Objection; form 09:53:56</p> <p>13 THE WITNESS: The light would come back through 09:53:56</p> <p>14 that lens that you have said, bounce off of a mirror and 09:54:03</p> <p>15 hit detectors Probably the corresponding detector that 09:54:07</p> <p>16 corresponded to the laser that fired -- 09:54:13</p> <p>17 MR JAFFE: How did you -- 09:54:13</p> <p>18 THE WITNESS: -- the fiber 09:54:13</p> <p>19 MR JAFFE: Sorry I didn't mean to interrupt 09:54:16</p> <p>20 Q How did you align the individual fibers to the 09:54:17</p> <p>21 individual detectors? 09:54:20</p> <p>22 MR KIM: Objection; form 09:54:22</p> <p>23 THE WITNESS: The fibers needed to be placed in 09:54:23</p> <p>24 precise mechanical location The diodes had to be -- 09:54:31</p> <p>25 the -- not diodes The avalanche diodes -- the 09:54:36</p> <p style="text-align: right;">Page 39</p>	<p>1 A The fibers were in a machine part where the holes 09:56:11</p> <p>2 were placed in high precision with respect to each 09:56:16</p> <p>3 other. At least, ostensibly, that was their intent. 09:56:19</p> <p>4 The at launch photodiodes had to be placed at -- 09:56:23</p> <p>5 on their PCB with similar accuracy or precision in their 09:56:26</p> <p>6 placement relative to each other. 09:56:30</p> <p>7 Q So you couldn't align the individual lasers to 09:56:31</p> <p>8 individual photodiodes. You had to rely on the 09:56:36</p> <p>9 manufacturing that they were sufficiently precise to get 09:56:38</p> <p>10 the alignment correct? 09:56:42</p> <p>11 A Okay. I understand your question. 09:56:45</p> <p>12 The alignment would have been done on the 09:56:46</p> <p>13 detector board as a whole to put that into proper 09:56:50</p> <p>14 alignment to the pattern of lasers. 09:56:54</p> <p>15 Q And the detector board -- what type of material 09:56:56</p> <p>16 were you using for that? 09:56:59</p> <p>17 A That was standard printed circuit material -- 09:57:00</p> <p>18 printed circuit board material. 09:57:05</p> <p>19 Q Was it hard to -- to align? 09:57:06</p> <p>20 MR. KIM: Objection; form. 09:57:13</p> <p>21 THE WITNESS: Can you be more specific about 09:57:14</p> <p>22 "hard"? I wouldn't presume anything of this precision 09:57:17</p> <p>23 was easy. 09:57:22</p> <p>24 MR. JAFFE: Fair enough. Come back to that. 09:57:23</p> <p>25 Q So the Spider design had -- you were working on 09:57:27</p> <p style="text-align: right;">Page 41</p>

1 that in the June/July time frame kind of -- that was the 09:57:33	1 A Mm-hmm. 09:59:33
2 first project after you joined; right? 09:57:36	2 Q -- who came up with that? 09:59:37
3 A Spider was basically the first major project we 09:57:38	3 MR. KIM: Objection; form. 09:59:38
4 took on after I joined Otto 09:57:41	4 THE WITNESS: I don't know, you know, who first 09:59:39
5 Q And it was you, Mr Gruver, Mr Pennecot, with 09:57:43	5 came up with that idea. There's probably examples of 09:59:43
6 some discussions with Mr Levandowski; is that right? 09:57:49	6 prior art in the literature. 09:59:46
7 A We were what? 09:57:50	7 BY MR. JAFFE: 09:59:48
8 Q I'm saying -- 09:57:52	8 Q So you can't tell me who came up with that idea? 09:59:49
9 A It was us who what? 09:57:53	9 A I can't tell you who invented that idea or -- 09:59:52
10 Q That were working on this Spider project 09:57:54	10 yeah, came up with that. 09:59:54
11 MR. KIM: Objection; form 09:57:57	11 Q I'm not talking about the idea generally. I'm 09:59:56
12 THE WITNESS: So Anthony Levandowski did not work 09:57:57	12 talking about for the Spider design. 09:59:57
13 on this design, to my knowledge The entire LiDAR team 09:58:00	13 A No, actually, I do not recall who originated the 09:59:59
14 did work on this design 09:58:04	14 idea of using that design at Otto. 10:00:01
15 BY MR. JAFFE: 09:58:05	15 Q So you can't tell me who came up with the 10:00:04
16 Q He -- he was involved in the discussions; right? 09:58:05	16 single-lens architecture in the Spider design; true? 10:00:08
17 MR. KIM: Objection; form 09:58:07	17 A True. 10:00:11
18 THE WITNESS: To my recollection, he did not have 09:58:08	18 MR. KIM: Objection; form. 10:00:12
19 any design discussion input 09:58:13	19 BY MR. JAFFE: 10:00:13
20 BY MR. JAFFE: 09:58:15	20 Q Okay. So we are just walking through the 10:00:20
21 Q So your testimony is that you didn't discuss the 09:58:16	21 timeline a little bit here. 10:00:21
22 LiDAR designs with Mr Levandowski? 09:58:19	22 We have the Spider single-lens architecture with 10:00:22
23 MR. KIM: Same objection 09:58:21	23 eight optical cavities. 10:00:25
24 THE WITNESS: No That's not my testimony 09:58:23	24 What happened next? We are in the July -- 10:00:29
25 My testimony is that I'm sure the -- the issue of 09:58:24	25 June/July time frame? 10:00:31
Page 42	Page 44
1 the project came up in discussion with him. My 09:58:28	1 A So the design was progressing in CAD, but -- and 10:00:32
2 testimony is that he did not provide design input into 09:58:31	2 I don't know what -- at this point, if you are trying to 10:00:42
3 the project. 09:58:34	3 keep me down to a specific timeline of June/July, you 10:00:44
4 BY MR. JAFFE: 09:58:35	4 know, things take some time to progress, and so 10:00:48
5 Q So you were talking with him fairly regularly, 09:58:38	5 somewhere later on we had some design in the CAD 10:00:51
6 since he was your boss -- 09:58:40	6 software that would shape -- that would look like a 10:00:55
7 A Yes. 09:58:42	7 Spider -- like a full LiDAR sensor. 10:00:59
8 Q -- but your -- your testimony is he didn't 09:58:42	8 Q What happened next? 10:01:02
9 actually contribute to the design; is that fair? 09:58:44	9 A At the same time, we would be fabricating 10:01:04
10 MR. KIM: Objection; form. 09:58:47	10 prototype components, not an entire sensor, but various 10:01:09
11 THE WITNESS: My interaction with him as my boss 09:58:48	11 subassemblies or components that would go into this 10:01:13
12 would be more in regards to project status. 09:58:53	12 design and begin testing them. 10:01:16
13 BY MR. JAFFE: 09:58:57	13 Q And what happened next? 10:01:17
14 Q So I'm going to ask my question again, is -- 09:59:00	14 A A rotary base design was getting fabricated -- 10:01:19
15 A Okay. 09:59:03	15 parts were being fabricated. Cavity was -- components 10:01:27
16 Q -- you were talking to Mr. Levandowski on a 09:59:04	16 were coming together. I was doing some tests of the 10:01:31
17 regular basis because he was your boss, but your 09:59:07	17 optical cavity myself and seeing how it performed. 10:01:34
18 testimony about the Spider design is that he didn't 09:59:12	18 Q So you were testing one of the optical cavities; 10:01:40
19 contribute to the design; true? 09:59:14	19 is that right? 10:01:46
20 MR. KIM: Objection; form. 09:59:16	20 A I was -- I was testing the design of the optical 10:01:46
21 THE WITNESS: I'm not aware of any contribution 09:59:17	21 cavity. 10:01:49
22 Anthony Levandowski had on the design of the Spider. 09:59:22	22 Q So for the design that you were testing, there 10:01:49
23 BY MR. JAFFE: 09:59:24	23 were eight fiber lasers -- or eight fibers behind one 10:01:52
24 Q Okay. The idea to use a single lens for both 09:59:25	24 fiber lasers; is that right? 10:01:57
25 transmit and receive and the use of a mirror -- 09:59:33	25 A At some point there -- I did test something that 10:01:58
Page 43	Page 45

1 had eight fiber lasers and eight avalanche photodiodes. 10:02:01	1 Q So what I'm trying to establish is that the 10:04:05
2 Q And just so I can understand the architecture 10:02:04	2 lasers going out and the photons coming back would both 10:04:07
3 here -- 10:02:04	3 go in the same shared space? 10:04:12
4 A Mm-hmm. 10:02:04	4 MR. KIM: Objection; form. 10:04:15
5 Q -- there would be eight fibers powered by one 10:02:08	5 THE WITNESS: The laser going out generally would 10:04:16
6 fiber laser. They would -- am I saying that wrong? 10:02:10	6 be considered coaxial to the receive light that comes 10:04:24
7 A Yeah, that's not quite accurate. 10:02:14	7 back in. I think there may be some region of space 10:04:28
8 Q Sorry. So can you explain? 10:02:16	8 where, due to the mirror fold, they cross path. 10:04:33
9 A Yes. 10:02:18	9 BY MR. JAFFE: 10:04:37
10 One optical cavity would have eight optical 10:02:19	10 Q Okay. It's the same -- just to kind of back up a 10:04:39
11 fibers. Those eight optical fibers would eventually be 10:02:24	11 little bit. 10:04:41
12 sourced by eight different fiber lasers. 10:02:27	12 They share the same optical cavity; is that fair? 10:04:42
13 If you go back to my term "matrix" or 10:02:34	13 MR. KIM: Objection; form. 10:04:45
14 "interlaced," I was trying to convey this complicated or 10:02:36	14 THE WITNESS: Transmit and receive are in the 10:04:46
15 64 eight-by-eight -- 10:02:41	15 same optical cavity. 10:04:49
16 Q Understood. All right. 10:02:42	16 BY MR. JAFFE: 10:04:51
17 A Yeah. 10:02:43	17 Q Okay. And when were you doing this testing that 10:04:51
18 Q Let me see if I can try and simplify it. 10:02:44	18 you referred to of this design that we have just been 10:04:54
19 There were eight lasers per optical cavity. 10:02:46	19 discussing? 10:04:56
20 A Yes. 10:02:50	20 A I'm recalling testing probably in the October of 10:04:56
21 Q Okay. So each laser would -- and I'm going to, 10:02:50	21 2016. 10:05:06
22 again, use more layman terms here. 10:02:56	22 Q So you were doing your testing. 10:05:07
23 A Okay. 10:02:58	23 Was it working? 10:05:15
24 Q They would shoot out. 10:02:59	24 MR. KIM: Objection; form. 10:05:16
25 Would they go directly to the -- to the lens, or 10:03:00	25 THE WITNESS: Could you be more specific about 10:05:20
Page 46	Page 48
1 would they bounce off something first? 10:03:02	1 "working." 10:05:22
2 A They would go directly to the lens. 10:03:05	2 BY MR. JAFFE: 10:05:23
3 Q Okay. Was there any sort of fast-axis 10:03:08	3 Q Were there any major problems that prevented you 10:05:23
4 collimation lens involved here? 10:03:15	4 from progressing with the Spider design? 10:05:26
5 A No. 10:03:16	5 A There were -- I would say there were issues, 10:05:32
6 Q And that's because we are in the fiber land, not 10:03:16	6 eventually, that were performance issues or concerns, 10:05:36
7 diode land; right? 10:03:18	7 yes. 10:05:42
8 A Correct. 10:03:19	8 Q What were those? 10:05:42
9 Q Okay. So we have our eight lasers. They shoot 10:03:20	9 A There were at least a couple that come to mind. 10:05:43
10 out through the transmit lens; right? 10:03:24	10 I was not impressed with -- I'm not sure that's 10:05:55
11 A Right. 10:03:26	11 the terminology. I was not necessarily satisfied with 10:05:59
12 Q They go to the target. 10:03:26	12 the strength of signal I was receiving on any one given 10:06:01
13 A Mm-hmm. 10:03:29	13 channel. Ultimately, later, when I was trying to get 10:06:10
14 Q They bounce back, and they go through the same 10:03:30	14 all eight fiber lasers and all eight detectors working 10:06:16
15 lens; right? 10:03:33	15 at the same time in one cavity, I was not getting good 10:06:20
16 A Yes. 10:03:33	16 response over more than, say, one or two channels. 10:06:25
17 Q And then they go to bounce off of a mirror and go 10:03:35	17 Q And so is this right when you guys pivoted to the 10:06:28
18 to individual photodetectors; is that right? 10:03:41	18 Fuji design? 10:06:35
19 A Yes. 10:03:43	19 MR. KIM: Objection; form. 10:06:36
20 Q And the -- the space where the transmit beams are 10:03:44	20 THE WITNESS: Could you be more specific about 10:06:36
21 going and where the receive photons are coming back, 10:03:51	21 the timing of your question. 10:06:41
22 those would be overlapping; right? 10:03:55	22 BY MR. JAFFE: 10:06:43
23 MR. KIM: Objection to form. 10:03:57	23 Q Well, you said you were testing -- 10:06:43
24 THE WITNESS: Could you be more specific? 10:04:00	24 A Yes. 10:06:45
25 MR. JAFFE: Sure. 10:04:04	25 Q -- Spider in October 2016? 10:06:45
Page 47	Page 49

1 A Yes. 10:06:50
2 Q When is the relationship in time to this testing 10:06:50
3 versus when you pivoted to Fuji? 10:06:55
4 A We pivoted to Fuji at a time later after this 10:06:57
5 testing. 10:06:59
6 Q So it would be late October 2016? 10:07:00
7 A Yes. 10:07:02
8 Q Did Uber's legal department tell you to pivot 10:07:02
9 away from Spider? 10:07:08
10 MR. KIM: Objection. Instruct you not to answer 10:07:09
11 the question on the grounds of attorney-client privilege 10:07:14
12 as to what Uber's counsel told you to do. 10:07:17
13 BY MR. JAFFE: 10:07:26
14 Q Did you stop working on the Spider design at the 10:07:26
15 direction of Uber's lawyers? 10:07:30
16 A Could you repeat your question? 10:07:33
17 Q Did you stop working on the Spider design -- and 10:07:36
18 I'll ask a little bit different question -- 10:07:38
19 A Yeah. 10:07:38
20 Q -- and pivot to the Fuji design -- 10:07:40
21 A Yeah. 10:07:42
22 Q -- at the direction of Uber's lawyers? 10:07:43
23 A No. 10:07:45
24 Q Okay. Were Uber's lawyers involved in the 10:07:47
25 decision to pivot to the Fuji design? 10:07:53
Page 50

1 A No. 10:07:59
2 Q So December 2016 -- well, actually, let me back 10:07:59
3 up. 10:08:16
4 Who was involved in the decision to pivot to the 10:08:16
5 design? 10:08:18
6 A I would say the decision was made between myself, 10:08:19
7 Eric Meyhofer. Scott Boehmke was involved in our 10:08:25
8 decision process as well. 10:08:30
9 Q And just to go back a few questions earlier, when 10:08:31
10 I asked you whether Uber's lawyers were involved in the 10:08:34
11 decision to pivot to the Fuji design, you answered no, 10:08:36
12 without any equivocation. 10:08:39
13 How do you know that? 10:08:45
14 A My understanding is the decision to pivot from 10:08:46
15 Spider to Fuji was a decision that I made with Eric 10:08:49
16 Meyhofer and with input from Scott Boehmke. 10:08:52
17 Q Where -- so, again, what is the basis for your 10:08:55
18 understanding or your testimony that Uber's lawyers were 10:09:00
19 not involved at all in the pivot? 10:09:04
20 A The decision to pivot was made by me, my boss, 10:09:06
21 with input from Scott Boehmke. That -- that's it. 10:09:18
22 Q And you said "my boss." 10:09:23
23 Who are you referring to? 10:09:25
24 A I'm sorry. Eric Meyhofer is my boss. 10:09:25
25 Q Oh, so at some point your -- your -- it changed 10:09:28
Page 51

1 from your boss being Mr Levandowski to Mr Meyhofer? 10:09:31
2 A Yes 10:09:34
3 Q When was that? 10:09:35
4 A That would have been after -- sometime -- I don't 10:09:35
5 recall exactly when, but sometime after acquisition by 10:09:38
6 Uber 10:09:41
7 Q Okay So you pivoted from the Spider single-lens 10:09:41
8 design to the Fuji design in late October 2016; right? 10:09:49
9 A Yes 10:09:52
10 Q Was the Fuji design -- was that kind of in 10:09:53
11 development under consideration before the pivot? 10:10:03
12 A That was -- as we spoke earlier, that was a 10:10:05
13 design that we had considered earlier on, and it was -- 10:10:13
14 you know, I could say it was always in the back of 10:10:17
15 people's minds perhaps 10:10:21
16 Q So starting about the beginning of November, Uber 10:10:22
17 ceased working on the Spider design; is that right? 10:10:29
18 A I'm sorry Repeat the question of what time? 10:10:32
19 Q Starting about the beginning of November, Uber 10:10:35
20 ceased working on the Spider design; is that right? 10:10:37
21 A That's my understanding 10:10:39
22 Q And then from November -- let's say November 1st 10:10:40
23 to approximately December 2015, Uber developed a kind of 10:10:51
24 a fully featured transmit board for Fuji in that time; 10:10:58
25 right? 10:11:02
Page 52

1 MR. KIM: Objection; form. 10:11:02
2 THE WITNESS: I don't remember when a fully 10:11:03
3 featured transmit board was designed. I don't remember 10:11:07
4 the date. 10:11:10
5 BY MR. JAFFE: 10:11:10
6 Q Would it surprise you if Uber was sending a 10:11:11
7 transmit board to a vendor for manufacturing by mid- -- 10:11:14
8 the middle of the December for Fuji? 10:11:19
9 A No. 10:11:20
10 MR. KIM: Objection to form. 10:11:22
11 BY MR. JAFFE: 10:11:23
12 Q Why not? 10:11:24
13 A Well, as we established, we made our pivot late 10:11:24
14 October, early -- early November, somewhere in that time 10:11:29
15 frame -- I think it was late October -- and one of the 10:11:32
16 first things we had to work on was a laser. 10:11:35
17 Q So you don't think that's a fast development time 10:11:39
18 to go from, essentially, no design to having a transmit 10:11:41
19 board in a month and a half? 10:11:47
20 MR. KIM: Objection; form. 10:11:48
21 THE WITNESS: No. 10:11:49
22 BY MR. JAFFE: 10:11:52
23 Q Okay. How long had you spent working on Spider 10:11:53
24 trying to get it working before you pivoted to Fuji? 10:12:00
25 A I don't remember the exact duration, but we can 10:12:09
Page 53

1 [REDACTED] 10:38:42
2 MR KIM: Objection; form 10:38:44
3 THE WITNESS: That would be me, Gaetan Pennecot, 10:38:45
4 and I'm not aware whether anybody else was involved at 10:38:54
5 the time Correction That decision would also have to 10:39:00
6 have involved Florin Edoniscu [phonetic] 10:39:04
7 BY MR. JAFFE: 10:39:09
8 Q Do the diodes in the Fuji design do they [REDACTED]
[REDACTED] 10:39:14
10 MR KIM: Objection; form 10:39:15
11 THE WITNESS: Could you be more specific when you 10:39:16
12 say [REDACTED] what you're referring to? 10:39:22
13 BY MR. JAFFE: 10:39:25
14 Q Do you have an understanding of what I'm 10:39:25
15 referring to when I talk about [REDACTED] 10:39:27
16 A Well, it's possible that they [REDACTED], and it's 10:39:29
17 possible that they [REDACTED] 10:39:36
18 Q Are they designed to [REDACTED] 10:39:37
19 A They are designed and intended to [REDACTED]
[REDACTED] 10:39:43
21 Q Why? 10:39:44
22 A The reason the laser diode would [REDACTED] [REDACTED]
[REDACTED] -- there's more than one reason But anticipating a 10:39:52
24 question by your look, there -- there would be -- 10:40:00
25 MR KIM: If -- if there's no pending question, 10:40:07
Page 62

1 you don't have to answer. 10:40:09
2 BY MR. JAFFE: 10:40:13
3 Q The question was: Why are they designed to 10:40:13
4 [REDACTED] 10:40:15
5 [REDACTED] [REDACTED]
[REDACTED] 10:40:19
7 Q Why are they designed to [REDACTED] 10:40:20
8 MR. KIM: Objection; form. 10:40:22
9 BY MR. JAFFE: 10:40:24
10 Q You can -- you cannot answer the question if you 10:40:24
11 want, but the question is: Why are they designed to 10:40:26
12 [REDACTED] 10:40:28
13 A Okay. 10:40:30
14 MR. KIM: Same objection. 10:40:30
15 THE WITNESS: The laser diode [REDACTED] [REDACTED]
[REDACTED] 10:40:41
18 BY MR. JAFFE: 10:40:48
19 Q Is that why Uber [REDACTED] 10:40:48
20 MR. KIM: Objection; form. 10:40:51
21 THE WITNESS: Yes. 10:40:52
22 BY MR. JAFFE: 10:40:54
23 Q So your testimony is that Uber designed the laser 10:40:56
24 diodes [REDACTED] [REDACTED]
[REDACTED]; true? 10:41:05
Page 63

1 MR. KIM: Objection; form. 10:41:07
2 THE WITNESS: That's my understanding. 10:41:08
3 BY MR. JAFFE: 10:41:09
4 Q Okay. How much are the diodes [REDACTED] [REDACTED]
[REDACTED] 10:41:17
6 A I'm not sure I know the number. 10:41:18
7 Q Is it [REDACTED] 10:41:22
8 A I wouldn't be surprised if it was [REDACTED] [REDACTED]
[REDACTED] 10:41:26
10 Q Okay. And to go back to my earlier question, the 10:41:27
11 Fuji design, in total, has [REDACTED] [REDACTED]
[REDACTED] right? 10:41:37
13 MR. KIM: Objection; form. 10:41:39
14 THE WITNESS: That is the current design. 10:41:40
15 BY MR. JAFFE: 10:41:48
16 Q Okay. How are the diodes aligned with respect 10:41:49
17 to -- for manufacturing purposes with respect to each 10:41:54
18 other? 10:42:00
19 MR. KIM: Objection; form. 10:42:01
20 THE WITNESS: [REDACTED] [REDACTED]
[REDACTED] 10:42:11
23 BY MR. JAFFE: 10:42:14
24 Q And there's a -- you provide an X/Y coordinates 10:42:15
25 to the manufacturer; right, for each of the laser 10:42:18
Page 64

1 diodes? 10:42:20
2 A Yes. 10:42:21
3 Q And what are the X/Y coordinates mapped to? 10:42:21
4 A They are referenced to fiducial marks on the PCB. 10:42:25
5 Q And have you ever used holes for those? 10:42:30
6 A Sorry? 10:42:35
7 Q For the fiducials, have you ever used a hole as a 10:42:36
8 fiducial? 10:42:42
9 A No. We have always placed the laser diodes using 10:42:43
10 the metal fiducial marks on the PCB. 10:42:46
11 Q And who came up with that idea? 10:42:48
12 MR. KIM: Objection; form. 10:42:50
13 THE WITNESS: I believe it's standard practice in 10:42:51
14 PCB manufacture. 10:42:54
15 BY MR. JAFFE: 10:42:56
16 Q So who came up with using it for Fuji? 10:42:56
17 A I don't know. 10:42:58
18 Q Okay. When did that design come up? 10:42:59
19 A I don't remember the exact date, but I think you 10:43:03
20 suggested there was a certain time frame. Did you say 10:43:09
21 December when boards went out? It would be in that 10:43:11
22 approximate time frame. 10:43:17
23 Q Well, just to be clear, I'm looking to your 10:43:17
24 testimony about this -- 10:43:20
25 A I understand. 10:43:20
Page 65

1 about when it would be ready? 11:00:37	1 Anthony Levandowski will find out and possibly even see 11:03:06
2 MR. KIM: Objection; form. 11:00:39	2 a demonstration. 11:03:10
3 THE WITNESS: As I've already told you, I gave 11:00:39	3 Q And why would they want to see a demonstration? 11:03:11
4 you more information to say that it's unlikely it would 11:00:41	4 MR. KIM: Objection; form. 11:03:13
5 happen in November and still somewhat unlikely it would 11:00:44	5 THE WITNESS: I can't tell you why they would 11:03:14
6 happen in De- -- in December. 11:00:47	6 want something. 11:03:17
7 BY MR. JAFFE: 11:00:48	7 BY MR. JAFFE: 11:03:18
8 Q But that's all the information -- 11:00:48	8 Q Why would you demonstrate it to them? 11:03:18
9 A That's all I can really say. 11:00:49	9 A At some point, we are going to demonstrate the 11:03:20
10 Q Okay. And the part of your declaration that 11:00:53	10 LiDAR sensor to ourselves, to our internal customers. 11:03:25
11 talks about this October 2017 readiness, that assumes 11:00:57	11 Ultimately, I would imagine it's possible we demonstrate 11:03:31
12 that you are going to be working on getting the device 11:01:00	12 to them as well. 11:03:35
13 ready between now and October; right? 11:01:02	13 Q Do you think it would be reasonable to 11:03:37
14 A Yes. 11:01:04	14 demonstrate the LiDAR sensor to the head of your 11:03:39
15 Q Okay. You said there are approximately 24 11:01:05	15 self-driving program? 11:03:44
16 employees currently working on the Fuji project; is that 11:01:10	16 A I think that would be reasonable. 11:03:44
17 right? 11:01:14	17 Q And that's one of the goals that you are aiming 11:03:47
18 A Yes. 11:01:14	18 for -- right? -- is demonstrating your LiDAR sensor to 11:03:47
19 Q To your knowledge, how many of them are former 11:01:21	19 the head of the self-driving program; right? 11:03:51
20 Google or Waymo employees? 11:01:26	20 MR. KIM: Objection; form. 11:03:53
21 A It would be far easier if you gave me the list of 11:01:28	21 THE WITNESS: I wouldn't call that a goal. 11:03:53
22 employees that I could go back and look at. I've gone 11:01:32	22 BY MR. JAFFE: 11:03:54
23 through this exercise before, but I would have to, like, 11:01:35	23 Q It's not a goal? 11:03:55
24 try to jog my memory to keep track of all the employees. 11:01:38	24 A No. No. My goal is to develop a LiDAR sensor 11:03:56
25 Q Is it more or less than half? 11:01:42	25 that can be demonstrated to internal customers to their 11:03:58
Page 82	Page 84
1 A I'm not sure. Half seems high. 11:01:44	1 satisfaction; that it is safe to put on a vehicle. 11:04:02
2 Q Okay. Now, how many employees are working on 11:01:51	2 Q Your testimony is that Mr. Levandowski's opinion 11:04:03
3 LiDAR, generally, at Uber, to your knowledge? 11:01:55	3 as to your LiDAR design is completely irrelevant; is 11:04:07
4 A To my knowledge, our team is the only team 11:01:57	4 that right? 11:04:10
5 actively developing a LiDAR sensor. 11:02:03	5 MR. KIM: Objection; form. 11:04:10
6 Q So if there are other folks with LiDAR 11:02:06	6 THE WITNESS: I -- I wouldn't say that either 11:04:11
7 responsibilities, that -- that would be incorrect; that 11:02:09	7 because you just suggested that the boss of my boss -- 11:04:15
8 the only people with LiDAR responsibilities are -- are 11:02:14	8 that his opinion is completely irrelevant. That's -- 11:04:21
9 you and the 24 employees described here? 11:02:15	9 that's an extreme statement. I couldn't back that up 11:04:23
10 MR. KIM: Objection; form. 11:02:18	10 with my testimony. 11:04:26
11 THE WITNESS: Including myself among the 24 11:02:18	11 MR. JAFFE: That's fair. 11:04:27
12 employees, we -- to my knowledge, we are the only ones 11:02:22	12 Q So you would agree that Mr. Levandowski, as the 11:04:29
13 actively developing LiDAR technology. 11:02:24	13 boss of your boss, has relevant input into Uber's LiDAR 11:04:32
14 BY MR. JAFFE: 11:02:27	14 designs; right? 11:04:36
15 Q Is there any upcoming demonstration of the Fuji 11:02:34	15 MR. KIM: Objection; form. 11:04:36
16 sensor to Mr. Levandowski? 11:02:38	16 THE WITNESS: Again, I think he would have 11:04:37
17 A No. Nothing is scheduled. 11:02:40	17 relevant input into the progress we are making in terms 11:04:40
18 Q Is that -- would that be a step in the -- in the 11:02:42	18 of the program itself as a whole. 11:04:44
19 development process, is a demonstration to 11:02:44	19 But when you say design, now that starts to speak 11:04:48
20 Mr. Levandowski? 11:02:50	20 of the internal construction, how we designed it, and, 11:04:53
21 A When you state it that way, no, I would not say 11:02:50	21 generally, no, he -- he does not have input to the 11:04:58
22 that one of the milestones was demonstrating to Anthony 11:02:52	22 design of the product. 11:05:01
23 Levandowski. 11:02:56	23 BY MR. JAFFE: 11:05:01
24 Q What about to Travis Kalanick? 11:02:56	24 Q So you never discussed with Mr. Levandowski how 11:05:01
25 A No plans. I presume, at some point, both he and 11:03:01	25 Otto or Uber's LiDARs are being designed; is that right? 11:05:08
Page 83	Page 85

1 A I don't know. 11:18:28	1 A Yes. 11:20:25
2 Q He just randomly showed up? 11:18:29	2 MR. JAFFE: All right. Put that aside. 11:20:27
3 MR. KIM: Objection; form. 11:18:31	3 Let's mark, as Exhibit 59, document Bates-labeled 11:21:06
4 THE WITNESS: I would have to speculate. I don't 11:18:31	4 UBER8488 -- I'm sorry. We are on 60, it looks like. 11:21:12
5 know why he came to this meeting, but, yeah, he -- he 11:18:33	5 Excuse me. 11:21:16
6 randomly showed up. 11:18:36	6 (Exhibit 60 was marked for 11:21:17
7 BY MR. JAFFE: 11:18:37	7 identification by the Court Reporter.) 11:21:17
8 Q Were you surprised that he showed up? 11:18:37	8 BY MR. JAFFE: 11:21:17
9 A Yeah. 11:18:38	9 Q Do you recognize the document I've put in front 11:21:33
10 Q Did you say -- 11:18:39	10 of you as Exhibit 60? 11:21:34
11 A That's part of the "fun chat." 11:18:40	11 A Just a moment. 11:21:36
12 Q Did you say, "Anthony, what are you doing here? 11:18:42	12 Q Are you still reading the document? 11:22:49
13 You have no involvement in this?" 11:18:45	13 A Yeah, just a moment. I'm almost done. 11:22:51
14 A No, no. I don't say, "Anthony, what are you 11:18:47	14 Okay. 11:22:54
15 doing here?" If he wants to show up to the staff 11:18:50	15 Q So my question was: Do you recognize the 11:22:55
16 meeting he's entitled to show up to the staff meeting. 11:18:52	16 document I placed in front of you? 11:22:57
17 Q Why is he entitled to show up to your staff 11:18:55	17 You are talking about the Spider design in these 11:23:04
18 meeting? 11:18:59	18 e-mails; right? 11:23:06
19 A Because he's my manager's manager. 11:18:59	19 A I'm not sure. This is very early after I joined. 11:23:07
20 Q Okay. All right. The optical layout paragraph 11:19:01	20 Q So looking at the first e-mail -- 11:23:19
21 in your e-mail? 11:19:02	21 A Yes. 11:23:22
22 A Yes. 11:19:03	22 Q -- in time, it refers to -- 11:23:22
23 Q It refers to something called "Chicken Bucket." 11:19:03	23 A Which one? 11:23:22
24 What is that? 11:19:07	24 Q From Mr. Boehmke. 11:23:28
25 A That is a name that we gave to the HDL-64 from 11:19:08	25 -- did Anthony share the doc we came up with here 11:23:30
Page 90	Page 92
1 Velodyne. 11:19:13	1 on Wednesday with you? 11:23:33
2 Q And why did you give it that name? 11:19:14	2 Do you see that? 11:23:36
3 A I'm sure I've heard somebody else refer to it as 11:19:19	3 A I see that. 11:23:36
4 the "Spinning Chicken Bucket" on the top of a car. 11:19:23	4 Q Do you know what that refers to? 11:23:37
5 Q And then the next line says: Separate TX and RX 11:19:26	5 A I'm not 100 percent sure, but I believe there was 11:23:38
6 cavity sides with their own specialized lenses. 11:19:32	6 a document -- I forget the title -- "LiDAR Thoughts." I 11:23:45
7 A Mm-hmm. 11:19:35	7 believe it involved Anthony Levandowski and Scott 11:23:54
8 Q What did you mean by that? 11:19:35	8 Boehmke. 11:23:56
9 A This was referring to the physical design of the 11:19:37	9 Q And then you get added to the thread on May 23rd 11:23:56
10 Fuji optical cavity that we were proposing that would 11:19:41	10 in that next e-mail? 11:24:04
11 have independent transmit and receive compartments. 11:19:45	11 A Yes. 11:24:05
12 Q So this was saying separate transmit and receive, 11:19:48	12 Q And it says: We have reviewed the doc a bit. 11:24:05
13 unlike what you were doing in Spider? 11:19:53	13 So you -- you reviewed this document? 11:24:08
14 A It was simply identifying the design heads 11:19:54	14 A Okay. Yes. 11:24:09
15 separate, as an adjective, not separate like a verb. 11:19:57	15 Q And then in Mr. Boehmke's e-mail above that from 11:24:11
16 Q Okay. And Gaetan was the one working on the 11:20:01	16 May 24th, it talks about: How far apart do they need to 11:24:19
17 optical layout for Fuji? 11:20:08	17 be -- 11:24:19
18 A Yes. 11:20:10	18 A Mm-hmm. 11:24:19
19 Q And just to make sure that I have all the 11:20:10	19 Q -- to not see a retro reflector from the other's 11:24:25
20 terminology right, Fuji is the same thing as 11:20:13	20 transmission. 11:24:28
21 905-nanometer? 11:20:17	21 That's talking about a monostatic single-lens 11:24:29
22 A That's -- that's a fair connection. 11:20:18	22 design; right? 11:24:31
23 Q And it's also called "V2" sometimes? 11:20:20	23 A I believe that's true. 11:24:32
24 A Yes. 11:20:23	24 Q So is it fair today to say that -- based on this 11:24:33
25 Q And V1 is Spider? 11:20:24	25 e-mail, that Mr. Levandowski was design -- helping 11:24:37
Page 91	Page 93

1 design the Spider device? 11:24:40	1 opinion about [REDACTED] 11:27:07
2 MR. KIM: Objection; form. 11:24:43	2 BY MR. JAFFE: 11:27:09
3 THE WITNESS: I would say, inasmuch as he 11:24:44	3 Q And so he was at least involved in this design 11:27:11
4 co-authored a document in -- that had influence on the 11:24:51	4 input into the design of the [REDACTED] for the Spider 11:27:13
5 LiDAR design, he had, early on, some -- some apparent 11:24:58	5 device; right? 11:27:15
6 input to the design, yes. 11:25:03	6 A Yes. 11:27:16
7 BY MR. JAFFE: 11:25:04	7 MR. JAFFE: Okay. You can put that one aside. 11:27:17
8 Q Okay. So Mr. Levandowski helped come up with the 11:25:06	8 This is going to be Exhibit 62. It's a document 11:27:32
9 basic design of the Spider device; right? 11:25:08	9 with Bates label UBER8592. 11:27:35
10 MR. KIM: Objection; form. 11:25:11	10 (Exhibit 62 was marked for 11:27:38
11 THE WITNESS: He appears -- I don't know -- the 11:25:11	11 identification by the Court Reporter.) 11:27:38
12 problem is I don't know what his authorship was in the 11:25:20	12 BY MR. JAFFE: 11:27:38
13 document, but the document had an influence in the 11:25:22	13 Q Mr. Haslim, do you recognize the document I 11:27:45
14 design of Spider. 11:25:26	14 handed to you marked as Exhibit 62? 11:27:48
15 BY MR. JAFFE: 11:25:27	15 A Yes. 11:27:55
16 Q But according to this e-mail, it's a document 11:25:27	16 Q And the first e-mail in time is one that you 11:27:56
17 that Mr. Boehmke and Anthony came up with that -- 11:25:29	17 wrote on October 26, 2016; right? 11:28:00
18 right? -- that served as the basis for the Spider 11:25:35	18 A Yes. 11:28:02
19 design; right? 11:25:36	19 Q And you are talking about V2, which we have 11:28:02
20 MR. KIM: Objection; form. 11:25:37	20 established is Fuji; right? 11:28:05
21 THE WITNESS: So I would say yes, it would show 11:25:37	21 A Right. 11:28:06
22 that Anthony and Scott Boehmke both contributed to this 11:25:44	22 Q So you are talking about this pivot right here in 11:28:06
23 document, and I can say that that document did 11:25:49	23 October 20-- October 2016; right? 11:28:11
24 contribute toward the design of the Spider. 11:25:51	24 A Right. 11:28:12
25 MR. JAFFE: Okay. Let's mark, as Exhibit 61, a 11:25:55	25 Q So I want to talk to you about this optical 11:28:12
Page 94	Page 96
1 document entitled -- labeled UBER6556. 11:25:58	1 cavity part of your e-mail. 11:28:19
2 (Exhibit 61 was marked for 11:26:08	2 A Okay. 11:28:21
3 identification by the Court Reporter.) 11:26:09	3 Q You said: We have not yet aligned a full pattern 11:28:21
4 BY MR. JAFFE: 11:26:09	4 of transmit and receive channels because the transmit 11:28:24
5 Q Mr. Haslim, you are on the cc line of this 11:26:15	5 elements are located by machined holes, and I'm skipping 11:28:26
6 e-mail; right? 11:26:17	6 some parentheticals. 11:28:30
7 A Yes. 11:26:18	7 What are you referring to? 11:28:31
8 Q And do you see Mr. Levandowski here is saying: 11:26:20	8 A This is referring to the V1, or the Spider 11:28:31
9 [REDACTED] 11:26:27	9 design; that [REDACTED] [REDACTED]
10 [REDACTED] 11:26:27	[REDACTED] [REDACTED]
11 Do you see that? 11:26:32	[REDACTED] 11:28:50
12 A Yes, I see that. 11:26:33	13 Q What do you mean by [REDACTED] "?" 11:28:51
13 Q What is he referring to? 11:26:34	14 A Maybe I didn't describe this well last time we 11:28:54
14 A He's referring to a component that goes into -- 11:26:35	15 talked about this. 11:28:58
15 or components that go into [REDACTED] [REDACTED]	16 [REDACTED] [REDACTED]
[REDACTED] 11:26:44	[REDACTED] [REDACTED]
17 Q And he's referring to this is in the -- this is 11:26:45	[REDACTED] [REDACTED]
18 for the Spider design; right? 11:26:47	[REDACTED] [REDACTED]
19 A Yes. This would have been for the Spider design. 11:26:49	[REDACTED] [REDACTED]
20 Q So Mr. Levandowski was involved at the level of 11:26:51	[REDACTED] [REDACTED]
21 specifying [REDACTED]	[REDACTED] 11:29:23
[REDACTED]; is that fair? 11:26:59	22 Q Okay. All right. The next line says: It also 11:29:23
23 MR. KIM: Objection; form. 11:27:02	23 features a custom beam-splitting mirror with a hole cut 11:29:26
24 THE WITNESS: I don't know that he's ever 11:27:02	24 into it. 11:29:29
25 specified the concentrations, but it appears he's got an 11:27:04	25 Do you see that? 11:29:29
Page 95	Page 97